age-length keys and length-weight relationships, and to provide information needed to calculate the total number of each age caught, which is needed for cohort analysis, a modelling technique. Growth rates, age at maturity, natural mortality rates, reproductive rates, and time and location of spawning are examples of other data that can also be obtained or calculated from catch data.

**Fishery-Independent Data** - The final source of fisheries data is through fishery-independent surveys. These include monitoring surveys to produce indices at regular intervals of juvenile and/or adult relative abundance and surveys to produce estimates of absolute or relative abundance. The surveys are extremely beneficial because they supply indices of abundance (CPUE) relatively free of changes in the catchability coefficient and the problems surrounding the collection of fishery-dependent data. Surveys are also a good source of biological data and can provide data pertaining to habitat use, and abiotic and/or biotic factors affecting stock distribution and abundance.

**Life-History Data** - Data on mortality, reproductive parameters, age, growth, and movements are important to stock assessments. Most of these data can be obtained in concert with collecting stock identification, fishery-dependent, and fishery-independent data. These data are also collected through special short term research projects.

The data described above can be used for stock assessments by calculating population parameters and/or developing population models. Parameters estimated include growth, abundance, mortality (fishing, natural, and total), fecundity, recruitment, and rate of reproduction as it relates to stock density. These population parameters can be used to develop population models calculating such outputs as yield-per-recruit, maximum sustainable yields, and others (Ricker 1975, Gulland 1983).

## AVAILABLE FISHERY DATA

Fishery-dependent and fishery-independent data on major North Carolina fisheries are available from a variety of sources, including the North Carolina Division of Marine Fisheries, National Marine Fisheries Service (NMFS), North Carolina Wildlife Resource Commission (NCWRC), and others. Information includes short-term research, such as fecundity and food habit studies, and long-term monitoring programs which collect data on annual relative abundance, age structure, and other population parameters. The DMF is the major source of these data which have been collected by a wide variety of projects (Appendix I). The major groups of data collected by the DMF are summarized below.

### Commercial Statistics

Commercial fisheries statistics are collected by state and federal port agents on a voluntary basis from seafood dealers and processors under a cooperative state/federal program. Data collected include landings by species (pounds and value), type of gear, waterbody of capture, distance from shore,